



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
19.05.2004 Bulletin 2004/21

(51) Int Cl.7: **B01L 3/00**  
// B01J19/00

(43) Date of publication A2:  
12.11.2003 Bulletin 2003/46

(21) Application number: 03017747.1

(22) Date of filing: 15.06.2000

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU**  
**MC NL PT SE**

(30) Priority: 22.06.1999 US 140215 P

(62) Document number(s) of the earlier application(s) in  
accordance with Art. 76 EPC:  
00944720.2 / 1 187 677

(71) Applicants:  
• **Caliper Life Sciences, Inc.**  
**Mountain View, CA 94043 (US)**  
• **Agilent Technologies, Inc.**  
**Palo Alto, CA 94303 (US)**

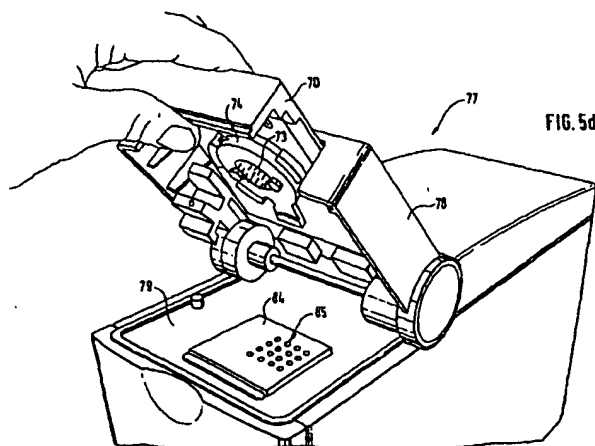
(72) Inventors:  
• **Berndt, Manfred**  
**76337 Waldbronn (DE)**  
• **Kaltenbach, Patrick**  
**76476 Bischweier (DE)**  
• **Kennedy, Collin B.**  
**Greenbrae, CA 94904-2442 (US)**

(74) Representative: **Kiddle, Simon John et al**  
**Mewburn Ellis,**  
**York House,**  
**23 Kingsway**  
**London WC2B 6HP (GB)**

(54) **Apparatus for the operation of a microfluidic device**

(57) In a system for operation or handling of a laboratory micro chip (41) for chemical processing or analysis, the microchip (41) is mounted in a first physical unit (42). The microchip (41) is arranged on a mounting plate, such that it is readily accessible from the top and thus the fitting and removal of the microchip is considerably simplified. Furthermore, the first physical unit (42) comprises an optical device (43) for contactless detec-

tion of the results of the chemical processes conducted on the microchip. The supply systems necessary for the operation of the microchip are arranged in a module unit that has a separable connection with a second physical unit. The proposed modular layout enables ease of interchangeability of the required supply systems and thus, overall, ease of adaptability of the proposed system for various types of microchips.





European Patent Office

EUROPEAN SEARCH REPORT

Application Number  
EP 03 01 7747

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	WO 98/05424 A (CHOW CALVIN Y H ;CALIPER TECHN CORP (US)) 12 February 1998 (1998-02-12)	1-5, 7-11, 13-15, 18,19,23	B01L3/00
X	* page 5, line 3 - page 7, line 4 *	22,25	
	* page 10, line 16 - page 11, line 13 *		
	* page 12, line 24 - page 13, line 17 *		
	* page 14, line 15 - page 15, line 14 *		
	* page 16, line 7 - page 17, line 20 *		
Y	* page 18, line 25 - page 21, line 28 *	3	
Y	* page 22, line 1 - page 24, line 6 *	4	
	* claims 2,4 *		
	* figures 1-4 *		
Y	----- US 5 534 328 A (BLAISDELL CHARLES T ET AL) 9 July 1996 (1996-07-09)	1-5, 7-11, 13-15, 18,19,23	
	* column 2, line 312 - column 2, line 39 *		
	* column 2, line 58 - column 3, line 23 *		
	* column 3, line 62 - column 3, line 64 *		
	* column 4, line 12 - column 4, line 43 *		
	* column 6, line 55 - column 6, line 67 *		
	* column 7, line 14 - column 7, line 22 *		
	* column 7, line 47 - column 7, line 51 *		
	-----		
A	US 5 849 486 A (O'CONNELL JAMES PATRICK ET AL) 15 December 1998 (1998-12-15) * the whole document *	1,2,6,7, 19	
	----- -/--		
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>18 March 2004</b>	Examiner <b>Koch, A</b>
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document	

EPO FORM 1503 03.02 (P04/C01)

European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 03 01 7747

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	WO 99/10735 A (BOUSSE LUC J ;CHOW CALVIN Y H (US); KENNEDY COLIN B (US); PARCE J) 4 March 1999 (1999-03-04) * page 4, line 6 - page 6, line 17 * * page 13, line 21 - page 14, line 17 * * page 14, line 36 - page 15, line 15 * * page 19, line 26 - page 22, line 26 * * page 23, line 17 - page 24, line 22 * * page 32, line 28 - page 33, line 20 * * page 34, line 13 - page 34, line 28 * * page 35, line 7 - page 35, line 28 * * page 36, line 12 - page 37, line 6 * * figures 1-6 *	1,2,4,6, 7,11,14, 20-22	
P,X	WO 00/02038 A (MOLECULAR DYNAMICS INC) 13 January 2000 (2000-01-13) * page 7, line 13 - page 7, line 31 * * page 13, line 11 - page 13, line 30 * * page 26, line 35 - page 27, line 13 * * figures 1-5 *	24	
E	-& EP 1 092 146 A (MOLECULAR DYNAMICS) 18 April 2001 (2001-04-18) * the whole document *	24	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	EP 0 695 941 A (AFFYMAX TECH NV) 7 February 1996 (1996-02-07) * column 7, line 16 - column 8, line 13 * * column 15, line 26 - column 15, line 56 * * column 20, line 46 - column 21, line 5 * * figures 3-6,18-20,30 *	24	
P,A	WO 99/38612 A (NANOGEN INC) 5 August 1999 (1999-08-05) * page 9, line 5 - page 9, line 29 * * page 10, line 33 - page 11, line 9 * * page 12, line 2 - page 12, line 12 * * page 14, line 3 - page 14, line 28 * * figures 1-3 *	24	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		18 March 2004	Koch, A
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.02 (P04.001)



European Patent  
Office

Application Number  
EP 03 01 7747

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



European Patent  
Office

LACK OF UNITY OF INVENTION  
SHEET B

Application Number  
EP 03 01 7747

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-23,25

Device for operating a microchip, system for enabling plural microchips with different microfluidic configurations to be interchangeably used  
---

2. claim: 24

Another system for enabling plural microchips with different microfluidic configurations having different supply element configurations to be interchangeably used  
---

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 03 01 7747

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-03-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9805424	A	12-02-1998	US 6399023 B1	04-06-2002
			AU 717981 B2	06-04-2000
			AU 3815697 A	25-02-1998
			CA 2259929 A1	12-02-1998
			CN 1226845 A ,B	25-08-1999
			EP 0952890 A1	03-11-1999
			JP 2000515630 T	21-11-2000
			WO 9805424 A1	12-02-1998
			US 6071478 A	06-06-2000
			US 6399025 B1	04-06-2002
			US 5955028 A	21-09-1999
			US 2002192112 A1	19-12-2002
			US 2002015667 A1	07-02-2002
			ZA 9706887 A	11-05-1998
			US 5534328	A
BR 9405989 A	26-12-1995			
DE 69413012 D1	08-10-1998			
DE 69413012 T2	25-03-1999			
EP 0688242 A1	27-12-1995			
JP 8508197 T	03-09-1996			
WO 9421372 A1	29-09-1994			
US 5690763 A	25-11-1997			
US 5849486	A	15-12-1998	US 5632957 A	27-05-1997
			US 6017696 A	25-01-2000
			US 5605662 A	25-02-1997
			AU 723134 B2	17-08-2000
			AU 6968996 A	17-04-1997
			BR 9610618 A	06-04-1999
			CA 2233238 A1	03-04-1997
			CN 1202929 A	23-12-1998
			EP 0852617 A1	15-07-1998
			JP 11512605 T	02-11-1999
			NZ 318253 A	28-02-2000
			US 6099803 A	08-08-2000
			US 2002085954 A1	04-07-2002
			WO 9712030 A1	03-04-1997
			US 6245508 B1	12-06-2001
			US 2002155586 A1	24-10-2002
			US 2003190632 A1	09-10-2003
			US 6309602 B1	30-10-2001
			US 6375899 B1	23-04-2002
			US 6319472 B1	20-11-2001
US 6638482 B1	28-10-2003			
US 6068818 A	30-05-2000			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 03 01 7747

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-03-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date		
US 5849486	A		US 6331274 B1	18-12-2001		
			US 6225059 B1	01-05-2001		
			US 6254827 B1	03-07-2001		
			US 6315953 B1	13-11-2001		
			US 2003073122 A1	17-04-2003		
			US 2001014449 A1	16-08-2001		
			US 6187642 B1	13-02-2001		
			US 6306348 B1	23-10-2001		
			US 6569382 B1	27-05-2003		
			US 6518022 B1	11-02-2003		
			US 6403367 B1	11-06-2002		
			US 6423271 B1	23-07-2002		
			US 6540961 B1	01-04-2003		
			US 6287517 B1	11-09-2001		
			US 6652808 B1	25-11-2003		
			US 2001026778 A1	04-10-2001		
			US 2001026935 A1	04-10-2001		
			US 6048690 A	11-04-2000		
			US 2001052976 A1	20-12-2001		
			US 2002028503 A1	07-03-2002		
			US 6051380 A	18-04-2000		
			AT 220459 T	15-07-2002		
			AU 702773 B2	04-03-1999		
			AU 3507095 A	27-03-1996		
			BR 9508908 A	28-10-1997		
			CA 2199515 A1	14-03-1996		
			CN 1164894 A ,B	12-11-1997		
			DE 69527375 D1	14-08-2002		
		WO 9910735	A	04-03-1999	US 5989402 A	23-11-1999
					AU 745644 B2	28-03-2002
					AU 9205298 A	16-03-1999
CA 2300075 A1	04-03-1999					
EP 1007954 A1	14-06-2000					
WO 9910735 A1	04-03-1999					
US 6582576 B1	24-06-2003					
WO 0002038	A	13-01-2000	US 6627446 B1	30-09-2003		
			EP 1092146 A1	18-04-2001		
			JP 2002519695 T	02-07-2002		
			WO 0002038 A1	13-01-2000		
			US 2001005489 A1	28-06-2001		
EP 1092146	A	18-04-2001	US 6627446 B1	30-09-2003		
			EP 1092146 A1	18-04-2001		
			JP 2002519695 T	02-07-2002		

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 03 01 7747

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-03-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1092146	A		WO 0002038 A1	13-01-2000
			US 2001005489 A1	28-06-2001
-----				
EP 0695941	A	07-02-1996	AU 2943695 A	04-01-1996
			DE 69527585 D1	05-09-2002
			DE 69527585 T2	03-04-2003
			EP 0695941 A2	07-02-1996
			EP 0764214 A1	26-03-1997
			JP 8166387 A	25-06-1996
			JP 10505410 T	26-05-1998
			US 2002058331 A1	16-05-2002
			WO 9533846 A1	14-12-1995
			US 2003003499 A1	02-01-2003
			US 5945334 A	31-08-1999
			US 6140044 A	31-10-2000
			US 2001041341 A1	15-11-2001
-----				
WO 9938612	A	05-08-1999	US 6071394 A	06-06-2000
			AT 246040 T	15-08-2003
			AU 743074 B2	17-01-2002
			AU 2344599 A	16-08-1999
			BR 9908349 A	05-12-2000
			CA 2319705 A1	05-08-1999
			CN 1291913 T	18-04-2001
			DE 69909971 D1	04-09-2003
			EP 1053055 A1	22-11-2000
			JP 2002502047 T	22-01-2002
			NZ 505858 A	27-09-2002
			WO 9938612 A1	05-08-1999
			US 2002155586 A1	24-10-2002
			US 6403367 B1	11-06-2002
			US 6280590 B1	28-08-2001
			US 2001045359 A1	29-11-2001
-----				

EPO FORM P045B

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82